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GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



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DIRECTOR

February 27, 2003

Mr. Henry Schuver
United States Environmental Protection Agency
Office of Solid Waste
Ariel Rios Building
1200 Pennsylvania Avenue, N.W. (5303W)
Washington, DC 20460-0002

Re: RCRA-2002-0033; Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)

Dear Mr. Schuver:

The Michigan Department of Environmental Quality (MDEQ) appreciates this opportunity to comment on the "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)," hereafter referred to as the VIG. As you know, the MDEQ has guidance for evaluating this important pathway and for developing generic cleanup criteria. Although the United States Environmental Protection Agency (EPA) objectives are somewhat different, we believe that our guidance should be compatible with that developed by the EPA. Our comments are presented with this in mind. The MDEQ looks forward to increasing our existing working relationship with the EPA for this guidance and other guidance that is needed to effectively address health and ecological risk from environmental contamination.

General Comments

Before commenting on specifics of the screening approach, it is not clear why the VIG could not be applied to petroleum releases from underground storage tanks (USTs). On page F-4, last sentence of the first paragraph, the EPA states that it is generally prudent to assume that biodegradation is not a factor when screening sites for vapor intrusion sites. The MDEQ believes that the VIG can provide an effective conservative screen for these sites and then allow for direct measurement of parameters, vertical soil gas profiling and/or modeling, essentially as provided in Q5 and Q6, semi- and site-specific assessment. This is as reasonable of an approach as is offered for other sites and chemicals.

The primary focus of the MDEQ review and comments is related to the screening evaluation approach used in the VIG to determine whether or not the vapor intrusion exposure pathway is complete, and if so, whether it poses an unacceptable risk to human health.

The MDEQ does not understand the emphasis or value of determining whether or not the vapor intrusion pathway is complete in Q4 through Q6. The core question at this stage of the process, after primary screening, is whether or not the vapor migration to indoor air pathway poses an unacceptable risk, not whether the pathway is complete or not complete. It may be technically inaccurate, and is often indeterminate, to designate the pathway as incomplete simply because

media-specific concentrations are less than media-specific target screening levels. However, the emphasis on determining pathway completeness is implied in the VIG by bolding the phrase “pathway complete” or “pathway incomplete” in the screening questions, and by using only these phrases in the flow diagrams in Appendix C (i.e., the flow diagrams did not include the decisions related to whether or not the pathway poses an unacceptable risk). Ultimately this wording approach is misleading and may be incorrect in some instances. As an example, if indoor air concentrations of a chemical are less than 10^{-4} target indoor air screening concentrations but greater than 10^{-5} target indoor air levels, and there are no background sources of the contaminant, one could argue that the pathway is complete, yet the VIG indicates the pathway as incomplete. As stated in the introduction of the VIG, “a complete pathway means that humans are exposed to vapors originating from site contamination.” This is clearly the case for this example. Also, for a risk manager to make informed decisions at a site they should know that the pathway is contributing some portion to the overall receptor population risk, instead of being led to believe that the pathway is incomplete.

The MDEQ believes that the pathway is most likely complete at this stage of the screening evaluation process; there is a source and building(s) and vapor migration is occurring. The question is whether media-specific concentrations are present at levels that could pose an unacceptable risk. We recognize that the wording in the screening questions uses “and/or” (e.g., the **pathway is incomplete** “and/or” does not pose an unacceptable risk to human health). MDEQ recommends that the EPA give consideration to eliminating the pathway completeness determination/designation from Q4 through Q6 and focus the questioning towards whether or not media-specific concentrations pose an unacceptable risk.

Detailed Comments

Comment 1

Roman numeral IV Tier 1: Primary Screening should be changed to Roman numeral V.

Comment 2 (A. Primary Screening, 2. What should you keep in mind? Page 15; Appendix E)

The EPA recommends that groundwater concentrations be measured or reasonably estimated using samples collected from wells screened at, or across the top of the water table. This statement infers that contaminants present below the top of the water table are not a concern and therefore, need not be sampled. We do not believe this is the intent of the recommendation. We also understand the need for technical consistency with using Henry's Law Constant to calculate source vapor concentrations that correspond to groundwater concentrations. This may be an acceptable approach to address current risk, but does not address potential future risk.

Many chlorinated hydrocarbon chemicals now known to migrate as vapors into buildings are often present below the top of the water table of aquifers or perched groundwater, and may be at higher concentrations in these areas than at the top of the water table because of their density relative to water. Because hydrogeologic systems can undergo changes, due to natural seasonal fluctuations of the water table elevation and/or through human activities, contaminants at depth within groundwater systems could pose future vapor intrusion potential. Consequently, the MDEQ recommends that the EPA consider applying the screening level approach to groundwater concentration measurements throughout the vertical profile of the groundwater.

Primary Screening – Question 2 under the section titled, “What is the goal of this question?” also limits the screening process to contaminants present in the uppermost saturated zone.

Comment 3

Roman numeral V Tier 2 - Secondary Screening should be changed to Roman numeral VI.

Comment 4 (A. Secondary Screening – Question #4)

[Q4(b)]: Although language under the section titled, “2. How should data be used in this question?” is provided to direct the user to select the appropriate screening level for comparison, it would be helpful if the parenthetical under YES also included this same instruction. Also, the EPA does not recommend any particular risk level. We believe this could lead to problems with determinations of the completeness of the pathway and/or whether the contaminant in question poses an unacceptable risk to human health. Clearly, different conclusions will be reached with different cancer risk levels used. How would the EPA respond to determinations that a site poses no unacceptable risk at 10^{-4} but does at 10^{-5} ?

Comment 5 (A. Secondary Screening. Subsurface Source Identification)

[Q4(c)]: It would be helpful to make reference to the section titled, “What if I have bulk soil data?” to make it clear to the user that this type of data is generally not recommended. It is also not readily clear and convincing why the uncertainties associated with the bulk soil sample data are significantly different from those uncertainties common to groundwater or soil-gas sample data. Would the EPA provide an explanation that distinguishes the differences in uncertainties associated with groundwater and soil gas sampling versus soil sampling?

Comment 6 (A. Secondary Screening, Groundwater Assessment)

[Q4(f)]: This question indicates that the EPA is requiring that sufficient data be obtained on all five factors before proceeding with the screening questions. Information and data on the last two factors are not readily obtainable, particularly the last factor on air exchange rate and indoor/outdoor pressure differential. Advection transport dominated situations cannot readily be determined and will vary with meteorological conditions, building characteristics, and HVAC operations. How should the user proceed through the screening process if they do not have this information? These factors also appear in Q4(i) and Q5(b).

Comment 7 (B. Secondary Screening – Semi-Site Specific Screening)

[Q5(a)]: The basis for the value of 50 may not be readily apparent to the common user. A specific discussion describing the derivation and basis for this value would be useful. In addition, applying a specific multiple begs the question of how to interpret a value slightly higher than 50. One approach may be to allow for professional judgment in applying the value of 50, and then requesting the user to explain the basis for deviating from the cut-off.

Comment 8 (B. Secondary Screening – Semi-Site Specific Screening)

[Q5(b)]: The MDEQ recommends re-wording the question as follows: “Are there site conditions and/or data limitations under which use of semi-site specific attenuation factors (based on the

Johnson-Ettinger Model) are inappropriate?" This wording approach is similar to that used in Q4(i).

Following the sentence of the third box (bullet format), "Any other situation....." another sentence should be added stating, "If applicable, please explain below."

Comment 9 (B. Secondary Screening – Semi-Site Specific Screening, Table 4)

The source of the information presented in the table should be shown and referenced.

Comment 10

Roman numeral VI Tier 3 – Site-Specific Assessment should be changed to Roman numeral VII.

Comment 11 (A. Site Specific Assessment – Q6)

[Q6(b)]: The terms "appropriate model" and "applicable model" are confusing. It seems more accurate to ask if appropriate input values are being used for various parameters in the model(s). That is, whether model input values that are representative of the physical site characteristics have been used in the modeling.

Concluding Statement

The overall structure of the screening evaluation process is well designed. The questions are orderly and closed, effectively preventing any decision paths that could lead to a dead end. The MDEQ commends the EPA on its thorough coverage of a very technically complex and important exposure pathway whose risk has gone unaddressed for too long.

Sincerely,

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jc:dp

cc: Andrew W. Hogarth, MDEQ
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